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ABSTRACT

Graduates (N=54) of a program for profoundly hearing impaired infants and their families were assessed from 1 to 6 years after leaving the program to determine the longitudinal effectiveness of the early intervention. Effects of five variables (sex, parents' educational levels, birth order, parents' hearing status, and age of intervention) on the Ss' early language functioning were measured, and later functioning was examined through teacher rating scales combined with the results of naturalistic classroom observations. Findings of maternal language analysis revealed that the maternal language repertoire appeared to reflect the mother's emotional state which, in turn, exerted long-term effects on the children. Remediation suggestions were offered for each of five key predictive variables: hearing status of the parents, educational level of the parents, age of intervention, sex of child, and presence of siblings. Conclusions stressed the need for attention to family functioning. (CL)

ANTECEDENTS OF LANGUAGE FUNCTIONING IN THE DEAF: IMPLICATIONS FOR EARLY INTERVENTION: PROJECT SUMMARY

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At the Lexington School, we are grateful to Dr. Leo Connor, Executive Director, for permission to use the School facilities. The data gathering and coding process took many years and the cooperation of teachers too numerous to name, as well as research assistants and associates. Included amongst the latter were: Diana Silber, Fran White, Ed Kenny, Barbara Richardson, Janet Mindes, and Joan Wolf. Special thanks also go to Mrs. Lucille Mazzoli and Dr. Alan Lerman. The data analysis was facilitated by the services available at the Academic Computing Center at Queens College and with the support of its Director, Dr. Richard White. We would also like to thank Carol Reich for her comments on earlier drafts of this manuscript.

Graduates of a program for profoundly hearing-impaired infants and their families were assessed from one to six years after leaving the program to determine the longitudinal effectiveness of the early intervention. The range of the childrens' abilities varied from those who were functioning well in a main-streamed environment (academically, linguistically, and social-emotionally) to those who had only primitive oral and gestural skills and who seemed not to have adapted well to school despite having been in a school setting from their second year of life. The focus of the research was therefore oriented to the question: why is it that some children "do well" while others do not, when they all (presumably) experienced the same early programming efforts?

We felt that the answer could lie in the fact that the children were different to begin with. Our first problem was how to objectively identify the factors affecting the differences. It was then important to see if these factors affected performance and continued to do so in a consistent and predictable way at later ages. A third objective was to identify the mechanisms by which the factors affected later performance. (This would enable us to focus on what - and who - had to be remediated.) Our final goal was to present our results so that they could be used to plan effective individually tailored remediation strategies.

Our population consisted of 54 prelingually profoundly deaf children and their mothers, who were either deaf (n= 15) or hearing (n= 39). All the children had been enrolled in a program for infants (birth to 3 years of age) at the Lexington School for the Deaf. The study was conducted longitudinally: graduates of the infant program

were assessed while they were in the program and anywhere from one year to six years later.

The Background Variables.

We began by identifying variables that were known to affect language functioning in children - both deaf and hearing -. Our data were readily observable and accessible factors, obtained from school records or from simple intake interviews. Each variable had been noted in the literature to affect the course of language development in predictable ways. (See also reference No. 1.) The factors and their predicted effects were:

(1) sex of the child: girls predicted to do better than boys.

(2) educational level of the parents (used as an alternative to the usual concept of socio-economic status, or SES): well-educated families predicted to have better functioning children than poorly educated families.

(3) birth order: later borns predicted to do better than first borns.

(4) hearing status of the parents: children of deaf families predicted to do better than children of hearing families.

(5) age of intervention (a composite age based on the age of diagnosis and age of entry into a program): 'early' children predicted to do better than those for whom intervention was late.

The first thing we looked for was whether any of the variables affected the early language functioning of the children.

Early Language Functioning.

The early language measures (up to 3 years of age) came from language scales which were revised specifically for the Project. (See reference No. 2 for full details.) These scales were administered by teachers who worked with the families on a weekly basis from the time of the infant's entry into the program until 36 months of age. Using these scales, the early language attainment was found to be affected by the age of intervention and the hearing status of the family in a complex, but entirely logical way.

Uniformly, in the simpler measures of language attainment (reception and expression of vocabulary and of simple request forms), all the children did better if intervention was early (i.e., prior to 18 months of age) - although none attained the same level as normally hearing children do -. In the more complex measures of language performance (comprehension and production of complex requests, semantic categories, and parts of speech), the effects were more complex and were tied to the hearing levels of the family: for deaf children of hearing parents (DCHPs), early intervention uniformly led to better outcomes for the children. However, for the deaf children of deaf parents (DCDPs), earlier entering children showed a depression in linguistic skills over time. Further, later-entering DCDPs did better than earlier entering DCDPs. These effects were not statistically significant, but they were uniform and consistent enough to warrant attention. We took these latter findings as evidence of a "bilingual effect" in operation.

The implication of these findings is that remediators must be careful when imposing a communication mode which is different from that used in the home. (This would be true for imposing orality on a signing family and for imposing signing on an oral family.) Unless the whole family is fully involved and participating, there is a danger of creating problems. The results are presented in detail and discussed more fully in reference No. 2. Please note that we are not suggesting that deaf families be advised against entering oral programs; we are advising that if the home language is'sign', then the family be provided with a signing worker so as to incorporate them more fully into the program..

It is important to note that for those measures which the children did attain, attainment was behind that of normally hearing children by one or two years. Girls seemed to do marginally better than boys, and birth order had no effect at all.

As distinct from linguistic performance, where speech skills were concerned early intervention benefitted all groups (i.e., those from deaf and those from hearing homes). This finding is important for remediation because it is another illustration of the difference between speech skills and language skills. Interestingly, it was not possible to directly predict later language functioning from the early language functioning.

Later Functioning.

The later functioning of the children was examined by using teacher rating scales combined with the results of naturalistic classroom observations. There were two separate aspects of functioning which were evaluated: language functioning and social-emotional functioning.

(1) The language functioning was measured by utilizing responses of the teachers on standard types of rating scales concerned with assessing the comprehension and production skills of their children. The judgements were made irrespective of mode (i.e., signed or spoken, or any combination thereof). Additional measures of language functioning were obtained by observing the receptive and expressive interactions of the children in classroom settings with their peers and with adults. (2) Social-emotional functioning was measured by teachers' ratings on a scale (The I-N-D Scale; see reference No. 3) which assessed the capacity of the child to function autonomously without being either overly dependent or overly independent. These assessments were corroborated by aspects of the classroom observations.

It was found that what was predictable from the earlier measures (both maternal language repertoires - see below - and early language performance) was the child's social-emotional, rather than his language functioning. Although it was not possible to directly predict the later language functioning in hearing-impaired children, we were able to identify significant pre-conditions for good language functioning. These could be characterized as the 'availability' of a parent who is able to deal with her child's handicap in a sensitive way. An implication of this is that remediation efforts should concentrate on helping parents so that children are not further handicapped by the problems of their parents. Before discussing the implciations further, we would like to show how we arrived at these conclusions. We will do this by discussing the nature of the data we collected and showing how we analysed it.

Maternal Effects on Later Performance.

One of our goals was to discover the mechanism by which the

variables worked. We did not believe, for example, that the variables (e.g., sex of the child) affected language in a direct way. The model we tested suggested that the variables exerted their influence indirectly - via their effect on mother-child interactions. Children acquire their language in a context. That context includes a close caretaker (usually the mother) and the regular events in which the caretaker and child engage. How the mother feels about the child and herself becomes part of that context. To the extent that those feelings are confused or negative, the consistency of the context is endangered.

Attention was focussed on maternal language input as one important aspect of mother-child interactions in order to facilitate comparison with existing literature on child language acquisition. The measures were taken from timed transcriptions of video-taped free-play sessions when the children were 24 months of age.

The findings were that, by comparison with mothers of normally hearing children of the same age, mothers of deaf children used a high proportion of directive language. In the normative literature, directive language is usually associated with poorer language development. In our population, the outcome for the child appeared to depend on how the directives were used, as well as on other complex factors: we found a repertoire of maternal verbal behaviors which, when packaged together, were predictive of performance in the children one to six years later - in the social-emotional realm, not in the language realm.

We found that mothers of children who were well-adapted later on used directives (imperative forms) in a sensitive relation to the language

levels of their children; they also spoke more quickly, used more complexities, and were more varied in their language use. (By 'sensitive relation' we mean that mothers of these well-adapted children used a lot of directive forms if the language level of their children was low, and few directive forms if the language level of their children was good. In other words, they were tuning into the communication needs of their children and were treating them as true partners in a dialogue.) Contrast this with the picture presented by mothers of children whose later outcomes were poor: these latter mothers tended to use a high proportion of directive language regardless of the performance levels of their children; they also spoke more slowly, used less complexities and less varied linguistic forms. These latter features were suggested to be indices of depression and of lowered expectations in these mothers. In other words, the maternal language repertoire was seen as reflecting her emotional state which, in turn, was shown to exert long-term effects on the children. It was suggested that the children were responding to the "music" and not to the "words" of their mothers' input to them.

These results supported our model which stated that the relationship between the background variables and later child performance was not direct - but operated via their influence on the mother- . A major implication of this finding is that treating the child alone is not sufficient, and that the mother has to be a central target of any treatment plan. It is of interest that 90% of the mothers of the children in the well-adapted group were well-educated (i.e., high SES) whereas 80% of the mothers of the poorly-adapted group had educations of high-school and below (low SES). This implies that the poorly educated parents were not being brought

into the program in ways which gave them effective parenting skills. These data and the conclusions drawn from them are fully described in reference No. 4.

The Individual Evaluation Profile ("IEP").

To come back to the set of goals we began with: the children in our sample were, indeed, different to begin with. Some of the differences (age of intervention, hearing status of the family, educational level of the family, and - to a lesser extent - the sex of the child) affected outcomes quite reliably. We are suggesting that the variables operate via their effects on the family. Although they cannot be changed directly, their effects, once understood, can be ameliorated by appropriate remediation efforts. Our recommendations are outlined below and illustrate how one can construct an individually tailored evaluation plan. This plan should enable a teacher or a therapist to make an evaluation of a family which could guide initial intervention efforts.

A difference between our "IEP" and the usual conception of an IEP is that ours is both a baseline assessment and a plan of action. It is intended to serve as a rule of thumb when a family first comes into a program. For example, given two hypothetical families, one can utilize our findings to make a good first treatment guess: contrast child A who is the only son of a poorly educated hearing family with child B who is the second daughter of a well-educated deaf family. On the basis of our significant predictor variables and some of the more impressionistic trends in our data, the broad approach associated with each of these variables can be extracted from the summary below.

1. Hearing Status of the Parents.

We found (as have others) that deaf children of deaf parents 'do better' in certain ways than do deaf children of hearing parents. This is true for a variety of reasons: the first is that the etiology of deafness is simpler (i.e., there is less likelihood of other complications). The second is that deafness is usally diagnosed earlier, the deaf child is accepted for what s/he is earlier, and has less problems in establishing communication.

What one has to do with respect to remediation is to ensure that hearing parents are made aware of the implications of the hearing loss. This is not a revolutionary recommendation EXCEPT that we are suggesting that deaf parents and hearing parents be treated differently because their problems are different. Hearing parents will need a different kind of emotional and psychological support system, as well as more information about deafness as a sensory deficit. For the deaf parents, one does not bring coal to Newcastle, and programming could proceed more quickly to problems involved with hearing aid use, auditory training, speech and language training, etc.

One must guard against alienating the parents from the child because of communication mode differences. One way of doing this with deaf parents in an oral program is to encourage hearing aid use by the parents. A way of doing this with hearing parents in a manual program is to encourage signing by the parents. The main thrust in all cases is to foster strong parental involvement and support.

2. Educational Level of the Parents (SES).

We found that children from well-educated families did significantly better than children from poorly educated families. The reasons for this are many and complex. One factor may be that parents with low education are reluctant to challenge or to question authority figures. The suggested remediation course is:

(a) Simplify the material.

(b) Vary its presentation and the contexts in which it is presented.

(c) Wait and see what a parent does when a situation comes up to see if understanding is there. Don't accept a tacit "I understand" as evidence of understanding.

(d) Repeat material as often as necessary when evidence of lack of understanding comes from parental behavior - and - vary the material when repeating it.

(e) Build up parental self-confidence by encouraging questions and differences of opinion. So-called 'authorities' do not have all the answers, and parents must be encouraged to feel that they are in control of their destinies and those of their children. Parent assertiveness may be a short-term nuisance, but in the long run it will pay off for everyone - especially for the children - .

(f) Start parent consciousness-raising groups to help foster (e).

3. Age of Intervention.

Early intervention (i.e., prior to 18 months of age) had uniform and significant effects on early language functioning - particularly for children from hearing homes who represent 90% of our prelingually deaf

population. However, this factor was not as clearly implicated in influencing later language function. We must remember the chain of effects which was elucidated in this study in order to see that we cannot dispense with this factor totally:

-(1) early language functioning was shown to influence the mother's perception of the child's capacities

-(2) this, in turn, could affect her expectancy of the child and could be expressed emotionally (slower speech, less spontaneous language, less complexities, etc.)

-(3) in turn, this was shown to have profound and lasting effects on the children's eventual performance.

Early intervention could break into this chain at any point. One simple solution would be that we continue our efforts to alert pediatricians to the hazards of delaying diagnosis. However, we still have to recognize that the problems of families who come to us 'later' are going to be different from those who come to us earlier. It may well be that in order to attain a particular endpoint, different routes will have to be traversed with these families.

4. Sex of the Child.

There were strong trends in or data indicating a gender difference. This appeared in: (a) the early language data, where girls did better than boys (Ms in prep.), and (b) in the differential use of maternal imperatives, where mothers used 'don't' and 'no' forms more with boys than with girls (Ms. in prep.). While we don't always know the reason for the differences, we do know that statistical and demographical studies concerning

emotional problems in deaf populations show that boys seem to have more of them than girls. It is also true that most remediation is geared towards mothers, if for no other reason than the time it takes place. This may mean that some of the differences we see are due to loss of a masculine role model for the boys, or that some kind of paternal distancing is taking place. Whatever the reason, we are suggesting that there is more of a potential problem in families with handicapped boys than in families with handicapped girls.

With respect to remediation, it becomes imperative to involve fathers as well as mothers. It is unfortunate that our school hours conflict with the working hours of fathers; evening meetings - particularly for fathers of boys - are strongly recommended. (Please note that we are not saying that we shouldn't involve fathers of girls; what we are saying is that fathers of girls may be more involved already.)

5. The presence of siblings.

Birth order was not found to bear a predictive relation with the measures in this study. However, for theoretical reasons, it may be the case that a later born child who is hearing impaired may have to be remediated differently than a first-born child who is hearing impaired. For one thing, if the first child was hearing, the parents' perceptions of themselves are not not as devastated as if their first child was born with a handicap. Secondly, parents who have had other children understand more about the usual pace of development and might, therefore not push realistically. A third important reason for feeling that there might be an effect of birth order is that a deaf child born into a home with other (hearing)

children has more of a source of speech and language stimulation available.

The suggestion for remediation is to incorporate additional emphasis on teaching parents of first borns about developmental processes so as to foster realistic expectations. This type of knowledge should also enhance parental ability to deal with a wider range of problems. A second suggestion is to advise parents to involve their child in integrated play groups and to foster exposure to a wide variety of social stimulation. A third suggestion is to provide integrated play groups as a standard resource of any early program.

In conclusion:

Assessing the variables described above leads to an individual evaluation profile which can be used to classify a family, and to grossly map some initial programming steps. It should be obvious that one result of our work is that a single therapeutic approach will not work for everyone. Programs should be flexible enough to cater to individual needs. Further, our work leads us to believe that the remediation target for early intervention is the family - and should not be the child alone - .

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